Health care issues/public health

P1 Blood exposure incidents among nurses in a general hospital

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Healthcare workers are frequently exposed to patients' blood, which may be infected with viruses such as HBV, HCV and HIV. The aim of this study was to analyze incidents involving blood contact by nurses during the last 3 years in a general hospital.

A sample of 156 of 232 nurses answered an anonymous questionnaire about blood exposure incidents and work routines. Seventy-six per cent reported at least one occupational blood exposure (93% mucocutaneous, 63% needlestick injuries, 20% cutting injuries). Their average age was 35 years (range 23–52) and the duration of employment was 11 years (range 1–28) The majority of the reported incidents occurred in hospital wards, in the winter, mostly during the morning. Seventy-five per cent of the nurses were wearing gloves at the time of the incident but only 44% were completely vaccinated against HBV. In 14 cases the patient had a known or later confirmed HBV or HCV infection.

It is concluded that the frequency of reported blood exposure incidents in nurses is high. Educational efforts must continue, so that adherence to universal precautions occurs.

P2 Percutaneous exposure and viral infections in hospital personnel directly involved in health care

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Objectives: To determine the occupational risk of viral infections in health care.

Methods: Blood samples of 42 hospital workers (HWs) who suffered percutaneous exposure were examined for HIV, hepatitis A, B, C and E viruses (HAV, H13V, HCV, HEV), cytomegalovirus (CMV) and Epstein–Barr virus (EBV).

Results: Ten of the HWs (24%) were 20 years old or younger. The source of exposure was HBV-positive blood in 13, HIV-positive blood in seven, HCV-positive blood in five, acute hepatitis A in one, acute CMV infection in one and unknown in 15. Nobody had occupational HIV infection. Six of 11 HWs (54%) seroconverted to HBV. One nurse seroconverted to HCV while she suffered acute hepatitis and her hepatitis became chronic within a year. Another nurse suffered acute E hepatitis 3 months after a needlestick accident dealing with a patient with acute hepatitis of unknown origin. Two other nurses were temporarily HCV RNA positive after exposure to HCV-positive blood but did not seroconvert.

Conclusions: (1) The occupational risk of HIV infection among HWs is lower than that of HBV or HCV infection. (2) The occupational HBV risk is a permanent factor despite the immunization among HWs. (3) The occupational risk of HCV infection is as high as that of HBV infection, but due to the lack of vaccine, the clinical consequences are more serious than those of HBV infection. (4) Hepatitis E infection can be contracted through blood exposure.

P3 A pseudo-outbreak of perimyocarditis among hospital staff

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Background: Forty people were diagnosed with perimyocarditis (PM) among the 414 personnel of a hospital in Germany in January 1987 to June 1998. The high incidence suggested a hospital-related outbreak.

Methods: Epidemiologic study to determine whether there was an outbreak and to identify possible hospital-related causes. Data were obtained from face-to-face interviews, medical records, and the hospital administration.

Results: Thirty-three of the reported 40 people were interviewed. The number of personnel diagnosed with PM increased steadily after 1994. They did not differ from the entire staff regarding profession, work site, age and gender. Six met our case definition for probable PM. Symptoms, physical examinations, blood tests and ECG results were unspecific. Minor pericardial effusion was the only pathologic echocardiographic finding and was seen in both probable cases and non-cases. The six probable cases showed more symptoms and pathologic findings than the 27 others, but did not differ regarding the type. There was a doubling of the total number of echocardiograms per year after a new echocardiograph had been introduced in 1993. This coincided with the increased number of diagnosed staff members after 1994.

Conclusions: An outbreak of PM is unlikely. The lack of clustering by profession or work site makes a hospital-related outbreak unlikely. Detection bias might have led to overdiagnosis and caused a pseudo-outbreak. Diagnostic criteria for new cases and for echocardiography are being developed.

P4 Antibiotic use in a northern Italian hospital: project for rational utilization

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Objectives: To apply a protocol for rational utilization of chemotherapeutics for prophylaxis and for therapy in S. Anna hospital.

Methods: Recent studies have demonstrated a strict correlation between antibiotic utilization and resistance onset. The introduction of rigorous protocols allows the reduction of resistance onset and the amount of antibiotic administered. It is important to rationalize the use of chemotherapeutics before widespread resistance to these drugs intervenes. The following are also necessary: (1) the creation of a guidebook concerning the use of antimicrobial therapy; (2) the use of expensive or particular antibiotics is approved only after a written detailed request according to the particular case; (3) the study of the prevalence of various nosocomial infections, with special regard to postsurgery infections; (4) the use of standard chemotherapeutic protocols in the prophylaxis; (5) the presence of the director of the infectious diseases division at periodic meetings concerning the evaluation of new chemotherapeutic protocols to be included in the

hospital guidebook; (6) the request for advice from a doctor of infectious diseases in the case of any doubt about antibiotic use.

Results: A taskforce including infectious disease doctors, a biologist, a microbiologist, an epidemiologist, a statistician and a chemist was formed. The following points were evaluated: (1) hospital infection etiology and emerging resistances; (2) nosocomial infection prevalence; (3) association between drug used and disease which needed hospitalization; (4) evaluation of antibiotic use; (5) DRG analysis; (6) review of the literature about hospital infections and antibiotic use; and (6) review of pharmaco-economics.

Conclusions: After these studies, new prophylaxis protocols were set up for special and general surgery. Guidelines were applied for pneumonia, urinary tract infections and sepsis. Standard data for comparing results were codified.

P6 Economic evaluation of the treatment of patients with moderate community-acquired pneumonia (CAP) in five European countries

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Objectives: A health economic study was carried out in Germany, Spain, France, Italy and Poland, investigating the cost-effectiveness of different antibiotics as first-line treatment of patients with community-acquired pneumonia (CAP) of moderate severity.

Methods: A third-party payer perspective was adopted. A decision tree model was populated for each of the five countries with estimates of the probabilities of clinical outcomes and healthcare resource use obtained from a Delphi panel of physicians (eight for each country). Costs in local currencies were determined by multiplying utilized resource items by the price or tariff of each item in each country.

Results: The economic analyses found that the key determinant of healthcare costs was the clinical failure rate of first-line treatment. This was due to the additional healthcare costs associated with treatment failure, which were mainly the costs of hospitalization. Cost-effective treatment of moderate CAP was more sensitive to the first-line clinical success rate than to the acquisition drug cost.

Conclusions: Overall, similar findings from five European countries suggest that cost-effective treatment of moderate CAP should focus on minimizing the risk of treatment failure following the first-line treatment rather than on minimizing the acquisition drug costs.

P7 Comparison of the use of a cost-effective method with two standardized methods to perform direct and repeatable susceptibility tests in a microbiology laboratory.

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We studied a new device, the 'Inodic' (I2A, Montpellier, France), based on the classical so-called platinum wand-type inoculator system, designed to inoculate a wide range of culture media. As this device seemed able to carry over a repeatable quantity of bacteria, we investigated its capability to standardize properly the inoculum concentrations for susceptibility tests. We performed a comparative study of Agar diffusion (CA-SFM guidelines) and a microbroth dilution (Dade-Behring) with the Inoclic device for determination of susceptibility tests of 155 fresh, consecutive clinical isolates. The 155 strains were divided into four groups: 46 *Staphylococcus aureus* (19 MRSA), 28 *Streptococcus* (nine *Streptococcus pneumoniae*), 61 Enterobacteriaceae (34 *E. coli*) and 27 *Pseudomonas aeruginosa*. In order to evaluate the accuracy and repeatability of our method, we performed inoculum concentrations and susceptibility tests according to guidelines or as specified by manufacturers with six ATCC reference strains: *E. coli* 25922, *Proteus vulgaris* 49132, *Pseudomonas aeruginosa* 27853, *K. oxytoca* 49131, *Staphylococcus aureus* 29213, *Enterococcus faecalis* 29212 and two reference (ATCC49219 and R6) *Streptococcus pneumoniae* strains. For Gram-negative rods, the antibiotics evaluated included piperacillin (Pip), tazocillin (Tzp), amoxycillin/clavulanate (A/C), cefotaxime (Ctx), ceftazidime (Tz), gentamicin (Gm), tobramycin (To), nalidixic acid (NA), ofloxacin (Ofl) and ciprofloxacin (Cip), and imipenem (Imp) cefepime (Fep) and amikacin (Ak) for *Pseudomonas* strains. Gram-positive bacteria were tested with penicillin (P), vancomycin (V), erythromycin (E), Gin, Ofl, Cip and sparfloxacin (Spx). All methods were performed using Mueller–Hinton agar with/without 5% sheep blood at 35°C overnight. Analysis performed by the least-square method of the results of the Inoclic method compared to the reference methods yielded correlation coefficients of 0.94 for P, AX, Tzp and Spx, 0.96 for Pip, Ctx and Tz, and 0.98 for Ofl, Cip, Gm and Ak respectively. In addition, error rate bounded analysis demonstrated no very major errors or single major errors. Despite only minor errors, isolates of *Streptococcus pneumoniae* produced less consistent results and accounted for a majority of minor interpretative errors. Overall, the Inoclic device appears to be a convenient and valid alternative to agar diffusion or broth dilution to determine the susceptibility of aerobic pathogens.

P8 Clinical and economic analysis of trovafloxacin

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Objectives: Trovafloxacin (T) was added to the formulary with utilization guidelines. The purpose of this study was to evaluate the clinical and economic impact of T.

Methods: Data were prospectively collected (gender, age, dose, allergies, monotherapy or combination use, and prescribing medical services) on patients who received T and entered into a computer database. A new software program was utilized to predict cost savings based on the percentage change in utilization of targeted antimicrobials. Actual antimicrobial monthly expenditures were collected to validate the software program.

Results: During a 4-month period, 422 patients (211 females, 211 males) received intravenous T. The mean patient age was 56 years (range 18–97). The dose prescribed was 300 mg/day in 51% patients; 31% were ICU patients. Penicillin and/or other allergies were noted in 51%. T was prescribed appropriately in 379 patients (90%): as monotherapy in 299 patients (79%) and appropriate combinations with either piperacillin or vancomycin in 80 patients (21%). Inappropriate combinations were prescribed in 43 patients (10%): clindamycin (14), azithromycin (11), a penicillin (10), and other (8). After pharmacist intervention based on guidelines for use, 13/43 were changed to T monotherapy. Services prescribing T were surgery (44.3%), general medicine (14.4%), and other (41.2%), all individually less than 5%. The software model predicted a drug acquisition

cost saving/month of 17 879 USD based on a 13.7% reduction of targeted antimicrobials. The actual mean reduction in costs was 17 714 USD/month (13.6%).

Conclusions: T is appropriately prescribed at a large university teaching hospital. A 17 714 USD/month decrease in antimicrobial costs was observed. Future studies will evaluate patient outcomes and adverse events.

P9 Pharmaco-economic considerations in selecting cephalosporins for a large teaching hospital

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Objectives: The goal of the present study is to describe the evaluating process and policy-making of the total use of cephalosporins in a large teaching hospital. The question was what would be the impact of introducing ceftriaxone and cefepime on the direct and indirect costs for cephalosporins as well as for their distribution over the current major indications.

Methods: First, it was necessary to determine for which indications, in which departments, and with which dosage regimens, the new drugs should substitute the older ones, and what would be the changes occurring in the use of other drugs. Then, four alternative regimens were proposed. Based on the actual use, a calculation of the expected costs was performed.

Results: Acquisition costs for first- and second-generation cephalosporins are very low. Ceftriaxone is three times more expensive, and even though the administration costs are low, the total costs are higher. Cefepime and ceftazidime have higher acquisition costs as well as higher administration costs because of multiple daily administration. The global cost calculation reveals that introduction of ceftriaxone increases the actual costs by 4–15%; the introduction of cefepime, however, lowers the costs by 13–21% as compared to the actual situation.

Conclusions: The proposed alternatives were considered therapeutically equivalent, whereas the introduction of the newer drugs simplifies the regimen and can lead to cost savings. It was shown that cost calculations have to be done for particular institutions based on their local prices and pattern of use.

P10 Quality improvement in starting antibiotic treatment in the emergency room

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Objectives: To improve the procedure from admission to the emergency room until the administration of antibiotics in patients presenting with a serious infectious disease needing immediate empirical antibiotic treatment.

Methods: The medical records and prescription charts of 50 patients admitted to the emergency room were evaluated. After the implementation of various interventions to improve the procedure, again the data of 50 patients were evaluated. The interval from presentation to the emergency room until the administration of antibiotics and the number of cultures taken for microbiological investigations were determined. The interventions consisted of introduction of guidelines on how to proceed with these patients on admission, organizational measures in the emergency room and instruction of the physicians and nurses in charge.

Results: The median interval was significantly reduced from 4.95 h to 3.21 h ($p<0.05$). The number of patients who received the first dose of antibiotics at predetermined standard application times was also significantly reduced from 54% to 32% ($p<0.05$). The number of patients admitted with suspected respiratory tract infection who had a sputum culture taken increased from 28% to 50%, and the number of patients with suspected urinary tract infection who had a urine culture taken increased from 50% to 100%.

Conclusions: In the attempt to provide optimal antimicrobial therapy it was possible to improve the quality of the procedure to start empirical treatment through a comprehensive intervention program that included all persons in charge of the patients. The implementation of guidelines as well as changing organizational obstacles led to a substantial quality improvement.

P11 The development of an antibiotic policy analytic tool

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Objectives: To develop an analytic tool to examine the content of antibiotic policies.

Methods: Antibiotic policies from 19 UK hospitals were used to derive various parameters: (1) potential effectiveness (20 items); (2) prophylaxis (13); (3) prescribing practice (35); (4) aminoglycoside monitoring (9); (5) specific treatment of urinary, lower respiratory and bloodstream infectious (42). Aggregated and specific analyses were fed back and each clinical microbiologist produced scorings for each category and answered a questionnaire exploring various aspects of process, e.g. teaching, audit, automatic stop-dates, involvement of pharmacy in audit.

Results There was huge variation in the types of document (policies, guidelines, newsletters, hybrids) available. In some there were as many as three different documents. Design variation was also apparent, e.g. the size varying from a 4-page portable policy to an A4-sized textbook. There were surprising omissions; for example, only three reminded the clinicians to provide prescribing information, and nine provided local resistance data. Only one included a junior doctor (who do most of the prescribing) in the prescribing committee, and only seven encouraged comments from new staff. There was a good relationship between high scores from the policy analysis and the process scores from the questionnaires, although there were one or two exceptions to this.

Conclusions: To our knowledge, this is the first attempt to produce such a tool. It was well received in various UK and EU workshops and by the first members of ESCMID ESGAP and the DGXII-funded HARMONY project.

P12 Possible role of some microorganisms in miscarriage, fetal death and stillbirth

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Objectives: To evaluate the presence of infectious agents in fetuses and newborns dead *sine causa* and to verify the incidence rate of bacterial infections in these cases.

Methods: Between 1 January 1995 and 30 June 1997, 332 fetuses and newborns from second-trimester miscarriages (138), fetal death cases (89) and stillbirths (51) *sine causa* were examined by means of microbiological and autoptic procedures. Fifty-four samples from therapeutic pregnancy termination were used as a control group. Aerobic and anaerobic bacteria, yeasts and mycoplasmas were sought

in lungs and placenta. Furthermore, the correlation between bacterial results and histologic phlogosis was studied.

Results: The incidence rate of bacterial isolation was higher in the first part of pregnancy (41% in lungs and 52% in placenta of spontaneous abortions) than in the second part (28% in lungs and 25% in placenta of fetal deaths). A high rate of bacterial isolation was found in stillborns (43% in lungs). In the control group, the isolation rate was 27% in lungs and 32% in placenta. *Ureaplasma urealyticum* was found in lungs (15%) (p=0.005) and placentas (27%) of miscarriages, in lungs of stillborns (17%) (p=0.004), and in lungs (9%) and placentas (10%) (p=0.05) from fetal deaths, but were absent in the control group. Mycoplasmas were found to cause phlogistic patterns in histologic samples.

Conclusions: It would be useful to identify pregnant women at risk in order to reduce the incidence of these infections and the probable fetal damage.

P13 The influence of extreme age in the length of stay and mortality among elderly patients with nosocomial infections (NIs) acquired in a short-stay admission unit

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Objectives: To analyze the incidence of NI in elderly (65–75 years old, E) and very elderly (>75 years old, VE) patients during two consecutive winter periods (1996–97) in a short-stay admission unit (<7-day admission), and the contribution of NI to length of stay and mortality.

Methods: In 1996, 31 E were compared with 58 VE. Patients with <=1 day of hospitalization were excluded. Age, sex, length of hospital stay, number and site of Nis and deaths were prospectively collected.

Results: Median age: 72 years (E) and 82.5 years (VE). Length of hospital stay: 7 days and 8 days (p NS). Incidence of NI: 12.9 and 8.6/100 patients (p NS), and 1.53 and 0.82/100 days of admission (p NS). Only one patient (E) had >1 episode of NI. Sites of NI: UTI (50% versus 20%), bacteremia (25% versus 20%), respiratory infection (25% versus 60%) (p NS). Mortality was higher for infected patients (25% versus 2.5%; p=0.03). The median length of stay for infected patients was 15 days versus 7days for non-infected patients (p=0.003). Baseline characteristics of patients in 1997 (E: n=26; VE: n=62) were similar, except for a marginally longer stay in VE patients (8.5 days versus 7 days; p=0.07). Results in 1997 also showed a longer length of stay and a higher mortality rate in infected patients (9 days versus 7 days, p=0.07, and 28.6 versus 3.7 days, p=0.03, respectively).

Conclusions: In a short-stay admission unit: (1) the incidence of NI is not different between E and VE patients; (2) NI is associated with a longer hospital stay; (3) NI is associated with a higher mortality.

P14 Does infection diagnosis change patient treatment?

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Over a 4-week period, we prospectively followed patients on our trauma and general surgery ICUs for development of infection according to CDC guidelines. One hundred and twelve patients were included in the study, 55 on the trauma and 57 on the general surgery ICU. During the study period, 34 (27 nosocomial) infections were detected on both units, resulting in an overall infection rate of 48.36/1000 patient days (pd) and a nosocomial infection rate of 38.41/1000 pd. Device-related infection rates for both units (i.e. ventilator-associated pneumonia, venous and arterial catheter-related infections and urinary catheter-related infections) were lower than reported by the NNIS System, except for similar ventilator-associated pneumonia rates.

We compared percentages of ICU procedures (chest X-ray and all-procedure rates), bacteriologic sampling, and antibiotic therapy. Rates were similar before and after detected infections except for the rate of antimicrobial therapy days per total patient days, which was significantly lower after infection. In our setting, a diagnosis of infection only influenced the number of days for which antibiotic therapy was administered.

P15 *Mycobacterium tuberculosis* and DOTS in the Free State

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Category:

Objectives: To reduce the incidence and curb the the spread of *Mycobacterium tuberculosis*, the directly observed treatment, short-course (DOTS) strategy was introduced. The study investigated the logistics of diagnosis and surveillance of strain types.

Methods: *M. tuberculosis* strains; March–May 1995 and November–January 1995–96 (133 strains), isoniazid (INH) and/or rifampicin antibiotic-resistant strains; March–July 1997 (50 strains), March–May 1998 sputum samples (312) screened. Screening Ziehl–Neelsen (ZN) staining and culture Löwenstein–Jensen (LJ). BACTEC system for confirmation and susceptibility tests. Fingerprinting *Pvu*II restriction of chromosomal DNA, IS6110 probe.

Results: In 1995–96, fingerprinting distributed the 133 isolates into 20 small clusters containing two or three isolates (43 strains), a contact clonal group of four strains from Bainsvlei and individual profiles of 86 strains. Only two of nine INH-resistant isolates were clonally related. Fingerprinting of resistant strains in 1997 identified 32 strains with different profiles, a person from Bainsvlei still with the same fingerprint/resistance profile (also 1998), an additional four local clonal groups and three clones that had spread to different districts throughout the Free State. South African strategy ZN screen only: of the 312 sputa tested, 30 people were ZN positive but a further seven people were positive by LJ culture. Of the 30 people who received treatment, only 13 returned for follow-up. Sixteen strains fingerprinted 15 different profiles.

Conclusions: Reactivation and non-adherence was evident, with resistant clonal groups developing both locally and regionally. DOTS in South Africa is met with euphoria as numbers decrease, but without government consideration for increased finances, management, coordination, treatment, compensation and diagnosis/surveillance, resistant strains may prevail.

P16 Retail-level contamination of cheese by *Listeria monocytogenes* (Lm): an investigation using multiple arbitrary amplicon profiling (MAAP)

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Manufacturers of food at risk of contamination by Lm take extensive precautions to ensure the safety of their products; however, these practices can be jeopardized if contamination is allowed to take place at the retail level. We report an instance in which evidence from molecular typing techniques suggests that such contamination can occur. Eleven samples from 10 brands of cheese from several different countries of origin received from a specialist outlet yielded Lm on culture. Samples submitted directly to our laboratory from the manufacturer of one of the implicated cheeses were, however, negative on repeated culture. MAAP of 10 isolates available for further study using the primer HLWL74 (5'-ACGTATCTG-3') revealed that although two isolates had unique profiles, five isolates (all of serotype 1) shared the same profile and the remaining three isolates (all serotype 4) were also indistinguishable. Given the diverse origins of these cheeses, it is likely that cross-contamination had occurred in the shop, possibly because the cheeses were displayed on a bed of straw (material which is likely to be contaminated with Lm) or because of transfer between cheeses by the use of common implements or poor employee hand hygiene.

P17 Poster deleted.

P18 Detection and enumeration of *Listeria monocytogenes* and *Listeria innocua* from dairy products by means of TaqMan real-time PCR

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Objectives: During the last decade much light has been shed on the detection of *Listeria monocytogenes*, which is a proven foodborne pathogen of great relevance for the dairy industry. *Listeria innocua* is substantially apathogenic to humans but serves as an indicator for hygienic conditions during production. Detection and enumeration by selective plating methods is time-consuming, and traditional PCR requires detection of the product after amplification and lacks template quantification. Our goal was the development of a real-time PCR-based method for the direct identification and enumeration of *L. monocytogenes* and *L. innocua* from dairy products.

Methods: For both assays the *iap* (invasion-associated protein) gene was chosen as target for primer and probe design. Two independent amplification systems were established for the two *Listeria* species. The 6-FAM labeled probe was designed to be used in both organisms. Optimization reactions were performed to choose the appropriate probe and magnesium concentration for the assays. To ensure that all types of *L. monocytogenes* or *L. innocua* strains were detected and that no cross-reactions within the two independent reactions occurred, specificity tests were carried out using more than 40 *L. monocytogenes* and 30 *L. innocua* isolates of different serotypes. Cross-reactivity was also tested on 30 strains not belonging to the genus *Listeria*. For the enumeration, standard curves, using defined numbers of copies, were established and the results were verified by comparison with the standard plate count method. Finally, the usefulness of the systems was evaluated on artificially and naturally contaminated raw milk samples.

Results: Concerning the tests for specificity, all organisms tested were identified correctly by the assays. No cross-reaction to non-*Listeria* species was observed. The sensitivity limit for using pure DNA was less than 40 copies/PCR reaction. For the enumeration of contaminated milk samples, the detection limit varies strongly with the DNA extraction method used.

Conclusions: Our results show that sample purity is a crucial parameter for quantification of the microorganisms in food. Using appropriate extraction procedures, the method can be a fast tool for detection of the two *Listeria* species in food as well as in clinical samples.

P19 Isolation of *Yersinia enterocolitica* and *Citrobacter freundii* in ice cream

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Objective: To study the occurrence of *Yersinia enterocolitica* and other pathogenic bacteria in ice cream samples and to optimize the suitable culture media for isolation.

Methods: Eighty ice cream samples collected from different groceries and supermarkets were analyzed for the presence of *Yersinia enterocolitica*.

Results: Both *Y. enterocolitica* and *Citrobacter freundii* were found in ice cream (26.25% and 18.75%, respectively). Thioglycollate medium was more selective and productive (22.5%) compared to Tryptone Soya Broth (TSB) supplemented with polymyxine (20 000 u/L) and 10 mg/L Irgasan (13.75%) and phosphate-buffered saline (10%).

Conclusion: The recommended drugs for *Y. enterocolitica* infection were chloramphenicol, gentamicin, tetracycline and trimethoprim-sulfamethoxazole.

P20 Occurrence of *Vibrio cincinnatiensis, Vibrio fluvialis* and *Vibrio furnissii* in cattle and swine in Germany

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In the USA, *V. cincinnatiensis* was described as a new human pathogen in 1986. Strains of this new *Vibrio* species had been isolated from blood and cerebrospinal fluid collected from a 70-year-old male without any known contact with seafood or salt water.

In Germany, two strains of *V. cincinnatiensis* were isolated from two aborted fetuses of cattle in April 1990. In November 1995, one strain was isolated from an aborted swine fetus. These infections were considered to be single events. Since July 1998, more than 50 *V. cincinnatiensis, V. fluvialis* and *V. furnissii* strains have been isolated from aborted fetuses and placentas of cattle and swine. *V. cincinnatiensis* was also isolated from vaginal swabs taken from a number of cows and sows after abortion and from feces of a number of sows, also after abortion. The infected animals had been reared in several herds in different regions of Saxony.

These findings indicate that the three *Vibrio* species can cause epidemics in animals and may also be endemic. Infected animals might be sources of infection for humans. At present, nothing is known about the sources of infection for the animals and the spread of the vibrios inside the animal.

P21 Failure to detect *Chlamydia pneumoniae* in brain sections of Alzheimer's disease patients

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The obligate intracellular bacterium *C. pneumoniae* is a common cause of respiratory diseases and strongly associated with arteriosclerosis. In a recent North American study, *C. pneumoniae*-specific DNA was detected in 17 of 19 late-onset Alzheimer's disease (AD) brains. In order to revalidate these findings in a northern European population, we screened paraffin-embedded tissue samples of brain areas with typical AD-related neuropathology (neurofibrillary tangles, bA4-amyloid) of 16 female (mean age 84 years) and four male (mean age 83 years) patients. After deparaffinization, DNA was extracted with phenol/chloroform and the yield was controlled by a pyruvate dehydrogenase PCR. *C. pneumoniae* DNA was amplified in a nested PCR using specific primers. The PCR product was identified by a digoxigenin-labeled oligonucleotide probe. As control for potential inhibitors of the PCR, a plasmid containing the target sequence was added to the DNA preparation and the PCR was repeated. In none of the 20 AD patients were *C. pneumoniae* DNA sequences detected. These findings could not be attributed to PCR inhibition or lack of sensitivity (approximately 10 copies of the target sequence). In our hands, the presence of *C. pneumoniae* in Alzheimer's brains is not a common phenomenon; an association between *C. pneumoniae* and Alzheimer's disease remains questionable.

P22 Norwalk-like virus outbreak in a home for the elderly

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Introduction: In the days following 31 December 1997, over 100 people with gastroenteritis among the approximately 120 employees and 420 residents of a home for the elderly were reported. Nine were hospitalized. Microbiological cultures of stool samples were negative.

Methods: Standardized questionnaires were administered to employees and residents to identify the source of the outbreak and risk factors for transmission. For ambulatory residents, face-to-face interviews were conducted on 14–15 January 1998. Cases were residents and employees who had vomiting and/or at least two loose stools/24 h between 15 December 1997 and 15 January 1998.

Results: Only results from the ambulatory residents will be presented. One hundred and thirty-two (42%) of the 309 interviewed ambulatory residents met the case definition. Illness onset occurred over a 3-week period. Attack rates did not vary by foods eaten. The risk of illness decreased with increasing time spent with persons not living in the home and the number of days absent from the home during the outbreak period (c2 for trend; $p=0.008$ and 0.04 respectively). All 13 tested stool samples of ambulatory residents were SRSV (small round structured virus)-PCR positive. Sequence analysis results were identical, the viruses belonging to genotype 2 of Norwalk-like viruses.

Conclusion: The long outbreak duration suggests person-to-person spread. Because Norwalk-like virus infection is often asymptomatic, the 42% attack rate suggests that nearly all residents were infected. The only protective factors were absence from the home or socializing with persons not from the home. This outbreak demonstrates the extreme transmissibility of Norwalk-like viruses in this setting.

P23 Immunization in 12–23-month children in a health area

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Objectives: To assess the vaccination situation of the children in the health area.

Methods: Our study was performed with cluster sampling, which was used by the WHO for their Expanded Immunization Programme. Thirty clusters were designed in the area by using the street populations, and each cluster had seven children. Thus, 210 children comprised our study sample. The children's immunization status was correlated with sex, the number of children in the family, parents' education level, whether the mother worked or not, if they had a health insurance or not, socio-economic level, and type of family. The children's parents were asked 25 questions in their homes.

Results: The sample was equally divided between boys and girls. Two hundred and two (96.2%) of 210 children were vaccinated for all six diseases, while eight (3.8%) of them were missing a few. None of the children had not been vaccinated at all. One hundred and eighty-five (88.1%) of the children had personal immunization papers and 25 (11.9%) did not. No significant relation was found between vaccination status and number of people living in the house, size of family, kind of family, socio-economic level of the family, health insurance coverage or the parents' parameters.

Conclusions: The health center's studies on childhood immunization were very successful.

P24 Financial impact and clinical implications of incorrect penicillin allergy diagnosis

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Penicillin allergy (PA) represents a barrier to optimization of antimicrobial use. Excessive cost and incorrect antibiotic use can be the consequence of wrong PA diagnosis.

Objective: To evaluate the correct diagnosis, financial impact and clinical implications of PA.

Methods: Between December 1997 and February 1998, patients with a history of PA admitted in our hospital were included. Baseline characteristics, need for antibiotics, cost of incorrect prescription of non-ß-lactams (if ß-lactams were indicated) and diagnosis of PA were prospectively collected.

Results: One hundred and six patients (64 women), median age 74 years, 20% with three underlying diseases, 23.6% with four admissions (last year). Median time since diagnosis of PA was 25 years; 68 (64.1%) patients with correct diagnosis of PA (16 anaphylaxia, 19 rash, 33 other skin symptoms); only 20 cases were diagnosed by a physician; 22.6% received ß-lactams after the diagnosis of PA with no consequences (four with possible history of anaphylaxia). Univariate analysis showed that a 20-year history of PA ($p=0.081$) and PA diagnosed by a non-physician ($p=0.008$; RR=1.52, 95% CI=1.01–2.28) were related to erroneous diagnosis of PA. Forty-three antibiotic treatments were prescribed (14 in patients with wrong PA) and 11 were erroneous: in 3/11 (27.2%) the choice was wrong, in 6/11 (63.6%) a reserve antibiotic was used instead of a b-lactam, and in 1/11 (9%) incorrect via of administration. The cost of incorrect treatments was 1346 euros/year (42 euros/wrong treatment).

Conclusions: (1) A history of PA is usually not verified, so many patients are falsely diagnosed. (2) Reserve antibiotics are overused in spite of ß-lactams, resulting in excessive cost and in incorrect antimicrobial use.

P25 Treatment of diabetic foot infections with amoxycillin/clavulanic acid—results of a German multicenter post-marketing surveillance program

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Objectives: Diabetic foot infections account for approximately 20 000 lower extremity amputations in Germany every year. This post-marketing surveillance program was conducted to assess the routine use of antibiotic therapy with amoxycillin /clavulanic acid (AMC) in patients with diabetic foot infections.

Methods: Patients 18 years or older with bacterial diabetic foot infections were observed in 38 German centers according to a surveillance plan. AMC was administered according to German physician circulars. Severity of infection was assessed at the start of and after treatment according to the Wagner score classification.

Results: Of 192 evaluable patients (193 documented), 108 were male and 84 female. The average age was 65 years (range: 35–96). Diabetic foot infection was based on neuropathy in 123 patients, and 57 patients had angiopathic diabetic foot infections (12 patients not assessable). A total of 195 feet with 233 infection localizations were treated. Most of the patients (170 (88.4%) received AMC t.i.d. Initial therapy was either 625 mg oral (83 patients), or 1.2 g (36 patients) or 2.2 g (51 patients) parenteral. Dosage was altered during therapy in 33 patients. However, only in five patients was dosage increased. Duration was 15 days (median) for first-episode treatment and 13.5 days (median) for recurrent infections. At the end of treatment, clinical success was 76.0% (36.5% closed ulcers, 39.6% reduced ulcers). Percentages of patients without symptoms at the end of therapy (baseline: symptoms at therapy start) were: pain 69%, watery drainage 65.1%, purulent material 82.5%, foul odour 80.5%. The average Wagner score was reduced by 1.3 (50%). Of 254 isolated bacteria, 92% were susceptible to AMC. Only six adverse events (mild to moderate) were assessed as being related or probably related to the medication.

Conclusions: Almost all bacterial isolates proved to be susceptible. AMC effectively reduced signs and symptoms in patients with diabetic foot infections and was well tolerated.

Laboratory diagnosis: Automation I

P26 Detection of methicillin resistance in clinical *Staphylococcus aureus* isolates by the Vitek2 system

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Objectives: To evaluate the Vitek2 automated system for the detection of oxacillin-resistant *Staphylococcus aureus*.

Methods: The detection of methicillin resistance (MR) in Vitek2 is based on bacterial growth in the presence of 3 mg/L oxacillin and 2% NaCl (Oxa Screen Test: OST) and MIC determination. The Vitek2 performance was assessed on 60 clinical isolates by comparison with the NCCLS- and CA-SFM-approved agar dilution (AD) method and the search for the *mecA* gene with PCR-RLFP as the reference method. The 60 *S. aureus* strains studied were divided into three phenotypes—homogeneous MR (20), heterogeneous MR (20) and susceptible (MS) (20)—based on the oxacillin disk diffusion method.

Results: Vitek2 oxacillin results were available in less than 4 h for all strains. Forty-two strains were positive for the *mecA* gene, including all MR strains and two MS. The specificity was 100% for the two tests on Vitek2 (OST, MIC) and for all the other methods. The sensitivity was better for Vitek2 (global, 98%; OST, 98%; MIC, 93%) than for the agar dilution methods: 55% for AD at 30°C/24 h, 81% for AD at 5% NaCl/24 h and 79% for AD at 2% NaCl/24 h.

Conclusions: This system represents an effective and accurate means for rapid detection of methicillin resistance in *S. aureus*, including the heterogeneous resistant strains.

P27 Comparison of two automatic methods used to identify microorganisms and determine susceptibility of these microorganisms to antibiotics

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Objectives: To compare two methods of bacterial identification, and two different methods to determine antibiotic susceptibility.

Methods: One hundred different microorganisms isolated from blood cultures of our patients have been studied. Identification systems compared: (1) API system (Bio-Merieux); (2) VITEK system (Bio-Merieux). Susceptibility systems compared: (1) microdilution system on broth (PASCO); (2) EXPERT VITEK (Bio-Merieux). Definition of discordance in susceptibility: when there is a difference in susceptibility to one or more antibiotics between the two methods, and their MICs differ in two or more dilutions.

Results

	IDENTIFICATION		SENSIBILITY	
	Concordances	Discordances	Concordances	Discordances
G (+)	43 (67.18%)	21 (32.81%)	36 (70.58%)	15 (29.41%)
G (-)	23 (100%)	0	13(56.52%)	10 (43.47%)
NFGNB	11 (84.61%)	2 (15.38%)	1 (7.9%)	12 (92.3%)

Streptococcus viridans and *Stenotrophomonas* sp.: it was not possible to determine the susceptibility. The VITEK system does not have the susceptibility card for the *Streptococcus viridans* groups available.

Conclusions: The concordance of the two methods of identification is high; we found better concordance in the Gram-negative group. The higher discordancies between the systems used to determine susceptibility were found in the non-fermenting Gram-negative bacilli (NFGNB) group.

P28 Comparison of two automatic routine methods for antimicrobial susceptibility testing (AST) of non-fermenting Gram-negative rods

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Objective and methods: The antimicrobial susceptibility of 106 non-fermenting Gram-negative rod (NFGNR) clinical isolates (96 *Pseudomonas aeruginosa*, five *P. fluorescens*, four *Chryseobacterium* spp. And one *Burkholderia cepacia*) were simultaneously studied by the PASCO (Difco) and Vitek (bioMérieux) systems. Standard disk diffusion (NCCLS) was used as reference method when relevant discrepancies were observed.